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REMARKS

Claims 14 - 49 are herein cancelled, without prejudice or disclaimer. Claims 2, 3 and 5 have been previously cancelled. Claim 57 is herein added. Accordingly, claims 1, 4, 6 -13 and 50 - 57 are presently pending in the application.

Applicant thanks the Examiner for noting the allowable subject matter of claims 1 and 4.

I. Rejection of Claim 50 Under 35 U.S.C. § 112, First Paragraph

Claim 50 stands rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing the requirement that the specification be enabling. More precisely, the basis for rejection alleges that claim 50 lacks components or limitations essential to support the performance of a recording function. The Examiner cites *In re Mayhem*, 527 F.d. 1229, 188 USPO 356 (CCA 1976) [sic: *In re Mayhew*, 527 F.2d 1229, 188 USPQ (BNA) 356 (CCPA 1976)], as supporting this proposition. For the following reasons this rejection is respectfully traversed.

The Examiner's reliance upon *Mayhew* is misplaced. The question presented in *Mayhew* was whether a method claim could stand without reciting a step which had been declared as critical by the applicant in the specification. *Id.* at 1231 - 32. That is, the step which was non-recited in *Mayhew*'s claims was presented in the specification not just as the best mode for enabling the invention, but as the only mode for enabling the invention. *Id.*

M.P.E.P. § 2172.01 provides guidance on this issue, stating that a rejection alleging failure of enablement under 35 U.S.C. § 112, first paragraph, may be appropriate when the claim fails to include "missing elements, steps or necessary structural cooperative relationships of elements described *by the applicant(s) as necessary to practice the invention*" (emphasis

added). In the instant application, however, Applicant has not stated that any particular single element, step, or structural cooperative relationship is necessary to practice the invention.

Additionally, claim 50 is absolutely clear on its face to one of ordinary skill in the art (or even one of little skill in the art) as providing (in a non-limiting embodiment of the instant invention) a recording apparatus to which an ink cartridge may be connected, wherein the connection between the recording apparatus and the ink cartridge includes an electrical connection, a pressurized air connection, and an ink connection.

What is more, claim 50 finds full support in the written specification and in the Figures. For example, Fig. 9 shows the ink cartridge connections comprising pressurized air connection 75, ink connection 71, and electrical connection 106. This is further exemplified in Fig. 12, which illustrates: (1) pressurized air connection 75 being capable of connecting to the printing apparatus 90 via female air connector 77; (2) ink connection 71 capable of mating with ink inlet 73; and (3) electrical connection 106 being capable of mating with electrical connection 92. Additionally, more than ample support exists in the written description of the invention, including, for example, page 50 (as to the ink inlet connection); page 51 (as to the air inlet port); page 67 (as to the electrical connection); and pages 72 - 73 (as to the electrical connection enabling the air pump once connection is made between the ink cartridge and the printing apparatus).

Certainly, any person skilled in the art (even one of very little skill in the art) finds the previous as fulfilling the written description, enablement and best mode requirements of 35 U.S.C. § 112, first paragraph. *See* M.P.E.P. § 2161. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. Claim Rejections - 35 U.S.C. § 112, Second Paragraph

Claims 6 - 9, 50 and 54 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. For the following reasons, this rejection is respectfully traversed.

As a threshold issue, M.P.E.P. § 2173 (and, more particularly, § 2173.02) provides guidance on this issue. Succinctly, the applicable inquiry under the second paragraph of § 112 is whether “the language of the claim is such that a person of ordinary skill in the art could . . . interpret the metes and bounds of the claim so as to avoid infringement[.]”

Claim 6

The basis for rejection of claim 6 alleges that the features of a contact face, a plane substantially parallel to the contact face and a plane substantially perpendicular thereto cannot be determined from the drawings. Clearly, however, the language of claim 6 is such that a person of ordinary skill in the art can interpret the metes and bounds of the claim so as to avoid infringement.

That is, claim 6 recites an ink cartridge including a circuit board, wherein the circuit board includes a contact face, the contact face being openly exposed at least on a plane substantially parallel to the contact face and a plane substantially perpendicular thereto. As shown in Fig. 9, for example (wherein a non-limiting embodiment of the present invention is illustrated), an ink cartridge 9 is provided, comprising a circuit board 106. As further illustrated in Fig. 16A, circuit board 106 comprises electrode contacts 106c (*see also* page 67 of the specification, lines 13 - 18). The electrode contacts are obviously provided on a contact face of

the circuit board 106, and as shown in Fig. 9, the contact face is openly exposed in relation to a plane substantially parallel to the contact face (that is, a plane created by making contact with the bottom periphery and four sides of element 102, for example; *see* Fig. 9). Additionally, the contact face is also openly exposed in relation to a plane that is substantially perpendicular to the plane that is substantially parallel to the contact face (that is, this second plane is created essentially by the side of ink cartridge 9 where the connectors 71, 75 and guide holes 105 are located).

Simply stated, the circuit board 106 has a contact face and the contact face is openly exposed on at least two planes, as described above, and as clearly shown in the Figures. One of any skill in the art could certainly interpret the metes and bounds of claim 6 so as to avoid infringement. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection. Additionally, the Examiner is respectfully requested to reconsider and withdraw the rejection as to claims 7 - 9 for the same reasons noted above (as claims 7 - 9 depend from claim 6).

Claim 50

Again, the test under the second paragraph of section 112 is whether the language of the claim is such that a person of ordinary skill in the art can interpret the metes and bounds of the claim so as to avoid infringement. Clearly claim 50 recites the subject matter of the claim more than clearly enough for one of even little skill in the art to understand the metes and bounds of the claim.

That is, claim 50 is absolutely clear on its face to one of ordinary skill in the art (or even one of very little skill in the art) as providing (in a non-limiting embodiment of the instant

invention) a recording apparatus to which an ink cartridge may be connected, wherein the connection between the recording apparatus and the ink cartridge includes an electrical connection, a pressurized air connection, and an ink connection. Clearly, the metes and bounds of claim 50 are blatantly recited in the language of the claim, as explained above and in Part I of this paper. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

Claim 54

Again, the test under the second paragraph of section 112 is whether the language of the claim is such that a person of ordinary skill in the art can interpret the metes and bounds of the claim so as to avoid infringement. Clearly claim 54 recites the subject matter of the claim more than clearly enough for one of even little skill in the art to understand the metes and bounds of the claim.

That is, claim 54 recites an ink cartridge for use with a recording apparatus, wherein an electrical connection is complete between the recording apparatus and the ink cartridge when the ink cartridge is mounted on the recording apparatus, the electrical connection comprising an electrical circuit enabling a pressure pump that pressurizes pressurized air. These features are precisely defined and distinctly claimed, such that even one of little skill in the art readily recognizes the metes and bounds of the claim.

Claim 54 recites the above-noted features, which are also shown (in a non-limiting embodiment of the instant invention) in Fig. 12 and described in the paragraph bridging pages 72 and 73 of the specification. Fig. 12 and the above citation disclose an ink cartridge 9 that is capable of being mounted to a recording apparatus 90.

When the ink cartridge 9 is mounted to the recording apparatus 90, the face of circuit board 106 makes contact with electrical connector 92. When circuit board 106 makes contact with electrical connector 92, an electrical circuit is thus completed, thereby energizing a pressure pump 21 (pressure pump 21 is shown in Figs. 1 and 2), wherein the energized pressure pump then supplies the pressurized air for pressurizing the ink cartridge 9 through pressure regulator 22 and pressure detector 23 via connectors 77 and 75.

While the basis for rejection alleges that it is not possible to understand where the electrical circuit comes from, Applicant respectfully responds that it is abundantly clear that the electrical circuit for powering the pressure pump comes from the ink cartridge being mounted to the printing apparatus. Moreover, the metes and bounds of claim 54 are blatantly and clearly recited in the language of the claim, as explained above. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. Claim Rejections - 35 U.S.C. § 102

Claim 10 stands rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by JP 60-198256 ("the '256 reference"). This rejection is respectfully traversed based on the following three rationales.

First, the '256 reference is deficient for not teaching or suggesting all the features of independent claim 10. Claim 10 recites that *after* the interior of the ink pack is in fluid communication with the recording apparatus through an ink outlet port formed on the ink cartridge, [*then*] an interior of the cartridge case is in fluid communication with the recording apparatus through a pressurized air inlet port formed on the ink cartridge. The '256 reference fails to teach or suggest at least these features of independent claim 10.

By way of example, Figure 4 of the '256 reference might depict a hollow needle 22 that appears to be longer in a horizontal direction than air connection port 32. However, hollow needle 22 connects to ink outlet port 15/45 through a sealing material of substantial length (this material sealing the ink within the ink bag and keeping the ink from escaping around the outer periphery of the needle once the needle has been inserted into the bag). Succinctly, the length of the sealing material within ink outlet port 15/45 prevents fluid communication at the ink outlet port prior to fluid communication at the pressurized air port.

Second, assuming for the sake of argument that hollow needle 22 were somehow depicted in the drawings as being long enough to pierce the ink bag sealing material prior to the air port being connected, proportions of features in a drawing are not evidence of actual proportions unless drawings are specifically disclosed as being to scale. *See* M.P.E.P. § 2125.

Third, the specification of the '256 reference clarifies that connection of the air port and ink port is committed simultaneously. Just prior to [Effect of Invention] on page 17 of the English translation of the '256 reference, it is stated that the connection of the ink and air ports is "completed at once." Accordingly, the reference is deficient in at least not teaching or suggesting that the ink port is in fluid communication prior to the pressurized air port being in fluid communication. Therefore, as explained by the above three reasons, the '256 reference fails to teach or suggest the above-note features. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV. Claim Rejections - 35 U.S.C. § 103

A. Claims 6 - 8

Claims 6 - 8 stand rejected under 35 U.S.C. § 103(a) as allegedly being anticipated by U.S. P. No. 6,130,695 (“Childers”). For the following reasons, this rejection is respectfully traversed.

Independent claim 6 recites an ink cartridge including a circuit board, wherein the circuit board includes a contact face, the contact face being openly exposed at least on a plane substantially parallel to the contact face and a plane substantially perpendicular thereto (these features are explained in greater detail in Part II of this paper). At least these features are altogether absent in the prior art relied upon as the basis for rejection.

The basis for rejection compares the electrical connector of Childers’ device (more precisely, circuit board 78 as shown in Fig. 10) to the above-noted features of independent claim 6. Indeed, the basis for rejection notes that Childers fails to teach or suggest the above-noted features of independent claim 6 (see pages 5 of the instant Office Action), but concludes that the above-noted features of independent claim 6 amount to a mere design choice.

In response, Applicant respectfully asserts that the above-noted features are not a mere design choice, as these features provide specific functionality above and beyond that disclosed by the Childers electrical connector device, as explained below.

In Childers, circuit board 78 is “trapped” within a box-shaped space, the space enclosing both sides of the circuit board 78, as well as enclosing the space directly across and parallel to the face of circuit board 78. Because of these features, (1) it is difficult to mount the circuit

board 78 to the device of Childers and (2) the type of connector (for instance, connector 70 shown in Childers' Fig. 10) is extremely limited in design, as only connectors that fit within the box-shaped space may be used.

In contradistinction to Childers, a non-limiting embodiment of the instant invention as recited by independent claim 6 comprises an open space substantially parallel to the contact face and an additional open space substantially perpendicular thereto. These features provide additional functionality over Childers' device.

For example, when the circuit board 106 is being attached to the ink cartridge 9, a worker's finger is (or manipulation/attachment tools are) able to perform the attachment. In comparison, in the Childers device, a worker's finger would not fit within the enclosed, box-shaped space to perform the attachment. Even assuming for the sake of argument that a worker installing a circuit board in the Childers device would be provided with extremely tiny fingers, the angle at which the worker would have to work would not be sufficient to hold the circuit board flat against the side of the cartridge.

Additionally, the features of independent claim 6 provide the feature that bulky connectors can be used, e.g., connectors with a depth greater than the box-shaped enclosed space which limits the size of Childers' connector. Accordingly, because of the above-noted features that are altogether absent in the prior art relied upon as the basis for rejection, the Examiner is respectfully requested to reconsider and withdraw this rejection. Additionally, the Examiner is respectfully requested to reconsider and withdraw the rejection as to claims 7 and 8 as these claims depend from claim 6 and thereby incorporate all of the features of independent claim 6.

B. Claims 6 - 9, 11 - 13 and 50 - 56

Claims 6 - 9, 11 - 13 and 50 - 56 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sato in view of U.S.P. No. 5,666,146 (“Mochizuki”) and further in view of Childers and U.S.P. No. 6,502,917 (“Shinada”). For the following reasons, this rejection is respectfully traversed.

i. Claims 6 - 9

Claims 7 - 9 depend from independent claim 6. Claim 6 recites, as noted in Part IV(A) of this paper, an ink cartridge including a circuit board, wherein the circuit board includes a contact face, the contact face being openly exposed at least on a plane substantially parallel to the contact face and a plane substantially perpendicular thereto (these features are explained in greater detail in Part II of this paper). At least these features are altogether absent in the prior art relied upon as the basis for rejection.

As noted in Part IV(A) of this paper, the Childers reference is deficient. Notably, Sato, Mochizuki and Shinada perpetuate Childers’ deficiencies (as noted in Part IV(A) of this paper). Succinctly stated, none of the references applied teach or suggest the feature of the opening planes as recited by independent claim 6. Because none of the references teach or suggest this feature, none of the references include the additional functionality of the instant invention as noted in Part IV(A) of this paper, above, and as recited in independent claim 6. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection as to independent claim 6 (and also as to dependent claims 7 - 9 at least by virtue of their dependency).

ii. Claims 11 - 13

Claims 11 - 13 depend from (or ultimately depend from) claim 10. As noted in part III of this paper, the Sato reference is deficient as to claim 10 for failing to teach or suggest fluid communication occurring between the ink cartridge and the printing apparatus prior to fluid communication occurring between the ink cartridge and the printing apparatus. Additionally, claim 10 does not stand rejected under § 103. Therefore, claims 11 - 13 are patentable for a first reason because the prior art fails to teach or suggest all of the features of the claims, as noted above. Secondly, claims 11 - 13 are also patentable at least because “[i]f an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious.” *See* M.P.E.P. § 2143.03. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

iii. Claim 50

Claim 50 recites the recording apparatus including connections for ink, pressurized air, and an electrical connection. The electrical connection completes an electrical circuit when the ink cartridge is mounted to the recording apparatus. The completed electrical circuit enables a pressure pump that (once the electrical connection has been made, thus enabling the pressure pump) provides pressurized air to the ink cartridge via the pressurized air connection. At least these features are altogether absent from the prior art relied upon as the basis for rejection, as explained below.

As recited by independent claim 50, the pressure pump is only enabled after the electrical connection is made between the ink cartridge and the printing apparatus. Succinctly stated, the

prior art used as the basis for rejection is collectively deficient in teaching or suggesting the above-noted feature of independent claim 50. That is, the cited prior art fails to teach or suggest pressure application being conducted after electrical connection is confirmed, as recited by independent claim 50. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

iv. Claims 51 - 56

Succinctly stated, none of the prior art references teach or suggest the positional relationship which is recited in independent claim 51. That is, the prior art cited as the basis for rejection collectively fails to teach or suggest an ink outlet port, a pair of positioning parts located opposite from one another with respect to the ink outlet port, an air inlet port, and a connection terminal of a circuit board having data memory, wherein the terminal is located opposite from the air inlet port with respect to the ink outlet port. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection as the prior art fails to teach or suggest the above-noted positional relationship.

C. Claims 50 -53 and New Claim 57

Claims 50 -53 stand further rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S.P. No. 6,062,667 (“Matsui”) in view of U.S.P. No. 6,281,911 (“Nakasawa”) and further in view of Sato. For the following reasons, this rejection is respectfully traversed.

i. Claim 50

Similar to Part IV(B)(iii) of this paper, the prior art cited as the basis for rejection fails to teach or suggest (as recited by independent claim 50), the pressure pump being enabled only

after the electrical connection is made between the ink cartridge and the printing apparatus.

Succinctly stated, the prior art used as the basis for rejection is collectively deficient in teaching or suggesting the above-noted feature of independent claim 50. That is, the cited prior art fails to teach or suggest pressure application being conducted after electrical connection is confirmed, as recited by independent claim 50. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this rejection.

ii. Claims 51 - 53

The basis for rejection alleges that the positional relationship as is recited by independent claim 51 amounts to a simple design choice. However, contrary to such allegations, it is respectfully averred that not only is the prior art deficient for not teaching or suggesting the positional relationship as recited by independent claim 51, but that the positional relationship as recited by independent claim 51 provides added functionality above and beyond the functionality of the cited prior art, as explained below.

As a first point, when the ink cartridge is mounted, the air inlet port and the terminal are the portions that provide a generally large friction and compression-fitting load, and therefore the air inlet port and the terminal being disposed to opposite sides with respect to the ink outlet port enable smooth mounting of the ink cartridge without causing an undesired or possibly damaging level of force on the ink outlet port (of the printing apparatus and/or the ink cartridge in general). Furthermore, the additional arrangement of the positioning parts on opposite sides of the ink cartridge with respect to the ink outlet port further enhances this advantageous feature.

Second, since pressurized air connections can be distributed to an opposite side of the ink cartridge from the electrical connections, design freedom for the recording apparatus can be

remarkably increased. Accordingly, because of the above-noted features that are absolutely absent from the prior art relied upon in the grounds of rejection, the Examiner is respectfully requested to reconsider and withdraw this rejection as to claim 51 (and additionally as to claims 52 - 53 by virtue of their dependency upon claim 51).

iii. New Claim 57

New claim 57 depends from independent claim 51 and is therefore patentable for the same reasons finding claim 51 patentable, as explained above. Additionally, claim 57 recites an exemplary, non-limiting embodiment of the present invention wherein the ink outlet port, the air inlet port, and the connection terminal are disposed so as to create a substantially linear line along a lengthwise direction of the surface.

This exemplary, non-limiting embodiment is shown, for example, in Fig. 28C. In the figure, the arrangement of the air inlet port, the circuit terminal, and the ink outlet port not overlapping one another (as viewed from above) creates a substantially linear disposition of the terminal and ports. Such an arrangement is advantageous in that it provides a relatively thin ink cartridge. Accordingly, as these features are altogether absent in the cited prior art, it is respectfully asserted that claim 57 is patentable for at least this additional reason.

VI. Conclusion

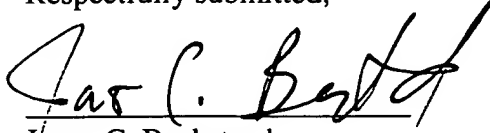
In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Application No. 09/937,130

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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